

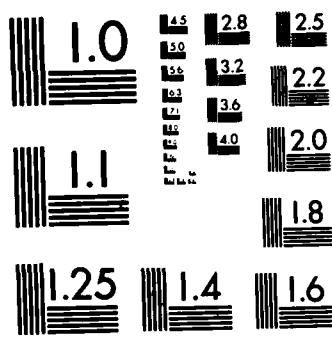
AD-A123 879

BATHYMETRY USING RADAR SIGNATURES(U) BERTRAM TECHNOLOGY 1/1
INC MERRIMACK NH C L BERTRAM 24 MAR 82
N00014-80-C-0450

UNCLASSIFIED

F/G 8/10 NL





MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

ADA 123879

DTIC "A"

1

BATHYMETRY USING RADAR SIGNATURES

Prepared by

C.L. BERTRAM

Technical Report No.

March 24, 1982

This Research was Supported by

The Office of Naval Research
Through Contract N00014-80-C-0450
Task Number

see also ADA 076 621

✓

Bertram Technology, Inc.
4 Maidstone Drive
Merrimack, NH 03054

APPROVED FOR PUBLIC RELEASE
DISTRIBUTION UNLIMITED

DTIC
ELECTED
JAN 28 1983
S D

D

83 01 28 065

DTIC FILE COPY

| | |
|---------------|-------------------------------------|
| Accession For | |
| NTIS GRA&I | <input checked="" type="checkbox"/> |
| DTIC TAB | <input type="checkbox"/> |
| Unannounced | <input type="checkbox"/> |
| Justification | |

By Bathymetry Using Radar Signatures
Distribution/

Availability Codes
Avail and/or
Dist Special

A

The results obtained from the computer study on N00014-79-C-0160 indicated that a monocycle radar is applicable for the detection and identification of salt water wedges beneath fresh or brackish water and may be a useful tool for rapid, remote bathymetric measurements.

Both laboratory and field tests were performed in an attempt to verify the computer results. The monocycle radars used consist of a pulse generator, a transmit/receive switch, an antenna and a receiver. These components were designed and fabricated by BTI on ONR contract N00014-80-C-0450.

Laboratory tests using four special purpose coaxial lines verified the computer predictions. The pulse reflected from the simulated salt water wedge stayed positive for a long time. This was thought by some to be an aliasing problem in the computer model. Laboratory tests confirmed these results and the positive trailing edge is called the "salt water effect". Additional laboratory tests using the tower tank at Dalhousie University showed that a distinct and diffuse salt water wedge could be detected under a 9 meter fresh water column. The antenna was both on the water and 3 meters above the water. The formation of a thermocline did not influence the results. With the antenna above brackish water (15.8%), both air/brackish water interface and brackish water/concrete interface (the bottom of the test tank) were detected.

Field tests on the Connecticut River gave additional credence to the monocycle radar's ability to detect and identify a salt water wedge through both fresh water and naturally occurring layers of brackish water above the wedge.

The monocycle radar presents a simple method of performing radar measurements without using a carrier. The broad spectral content of

the pulse makes it possible to identify as well as detect objects.

This final report is presented in summarized form because the plethora of data and results in monthly reports to ONR would fill many volumes of a book.